Active Project (2014 - 2017)

Exploration Docking Hatch Project

Advanced Exploration Systems Program | Human Exploration And Operations Mission Directorate (HEOMD)

ABSTRACT

AES, in partnership with JSC Engineering, Lockheed Martin, and the Orion Program, is developing a docking hatch system design and hardware for use on in-space habitation systems.

ANTICIPATED BENEFITS

To NASA funded missions:

Developing a common, light-weight hatch for in-space habitation systems will reduce costs for the development of systems across architectures and reduce the risk of incompatibilities in spacecraft docking.

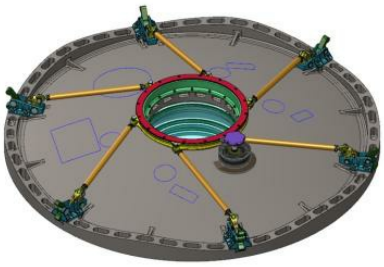
To the commercial space industry:

Developing a common, light-weight hatch for commercial in-space habitation systems will reduce costs for the development of systems across architectures and reduce the risk of incompatibilities in spacecraft docking.

DETAILED DESCRIPTION

A deep space compatible docking hatch is necessary for missions beyond LEO (low Earth orbit). This project takes incremental steps toward development of a standard, weight-optimized docking hatch system compatible with the international docking standard and available for use by commercial partners on the road to exploration. This eliminates redundant development costs among partners and allows focus on other technologies. The ultimate goal is to develop a lighter hatch that meets all the needs and requirements for deep space missions.

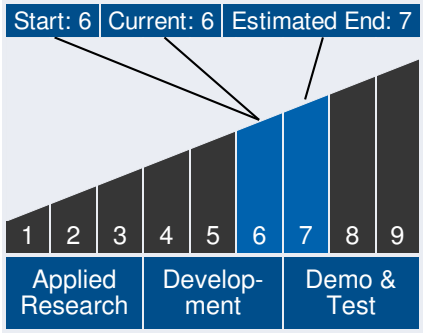
The objective of the Exploration Docking Hatch project is the advancement of a docking hatch system that can be cleanly transferred to in-space habitation system projects such as NextSTEP BAA Habitation awardees. This will allow NASA to transfer flight pedigree technology at a shared cost level and for



Docking Hatch

Table of Contents

Technology Maturity



Management Team

Program Director:

- Jason Crusan

Program Executive:

- Douglas Craig

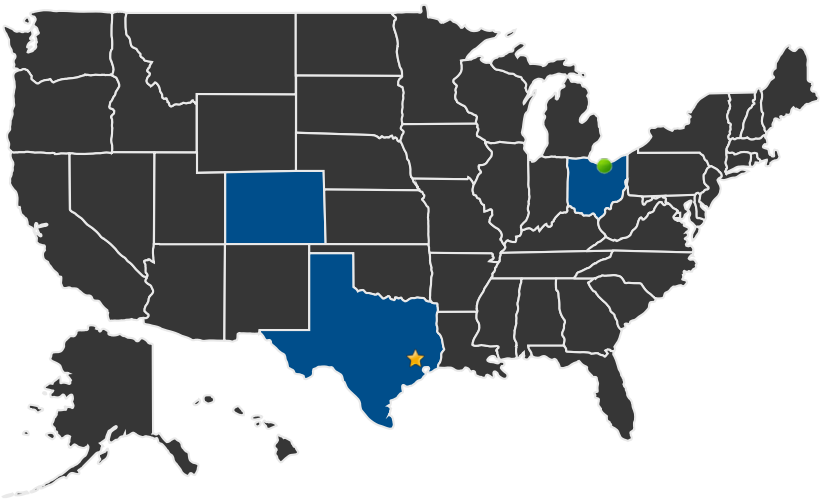
Continued on following page.

Exploration Docking Hatch Project

Advanced Exploration Systems Program | Human Exploration And Operations Mission Directorate (HEOMD)

NASA's commercial partners to focus on innovations aligned with the partners' strengths.

U.S. WORK LOCATIONS AND KEY PARTNERS



U.S. States With Work

Lead Center:
Johnson Space Center

Supporting Centers:

- Glenn Research Center

Contributing Partners:

- Lockheed Martin Space Systems Company

DETAILS FOR TECHNOLOGY 1

Technology Title

Docking Hatch

Technology Description

This technology is categorized as a hardware component or part for manned spaceflight

Management Team *(cont.)*

Project Manager:

- David Hall

Principal Investigator:

- David Hall

Technology Areas

Primary Technology Area:
Materials, Structures, Mechanical Systems and Manufacturing (TA 12)

- Mechanical Systems (TA 12.3)
  - Deployables, Docking, and Interfaces (TA 12.3.1)

Exploration Docking Hatch Project

This technology is categorized as a hardware component or part for human spaceflight. The docking hatch is used to support the docking of two crewed spacecraft in space.

Capabilities Provided

This technology will provide the capability for two spacecraft to dock in space and be able to transfer crew and cargo from one spacecraft to another.

Potential Applications

In-space habitation systems require docking hatches to support in-space operations. This hatch will have application for the Orion spacecraft, commercial partners, cis-lunar habitation systems, and Mars spacecraft.

Performance Metrics

Metric	Unit	Quantity
Ability for crew to safely transfer from one habitat to another while in space.	100%	1